SOFTWARE-IMPLEMENTED TRANSFORM AND LIGHTING MODULE AND PIPELINE FOR GRAPHICS RENDERING ON EMBEDDED PLATFORMS USING A FIXED-POINT NORMALIZED HOMOGENOUS COORDINATE SYSTEM

ABSTRACT OF THE DISCLOSURE

A software-implemented transform and lighting module and pipeline designed and optimized for embedded platforms (such as mobile computing devices). The transform and lighting module and pipeline includes a number of features that make it well-suited for use on embedded devices. These features include a single streamline branched architecture that allows efficient processing on a CPU of an embedded device and saves computational time. This architecture is facilitated by use of a vertex cache that stores vertices as needed to avoid duplication in processing of the vertices. A culling feature culls vertices before lighting instead of lighting all vertices. A back face culling technique examines each of the vertices to determines whether a back face of a triangle is formed. If so, then the vertex is culled. A second technique involved determining whether a vertex is outside of one view frustum clip plane. If so, then the vertex is culled.